Abigail R. Carr. An Experiment with Art Library Users, Signs, and Wayfinding. A Master's Paper for the M.S. in L.S degree. April, 2006. 49 pages. Advisor: David Carr

This paper discusses the effects of stack end signage on user wayfinding success in searches in academic libraries. Site visits to the Chapel Hill Public Library and the Cameron Village Branch Library provided models for test signage for the study, as did the available literature on wayfinding and effective library signage. A three week study was conducted to survey the effects of three different iterations of signage on the success of subjects performing test searches—the subjects used the UNC Chapel Hill online catalog and the posted signage to locate materials in the Sloane Art Library. The results of the study were evaluated qualitatively and suggestions were made for further study and suggestions for elements of effective academic library signage were made.

Headings:

Library signs

Signs in libraries

College and university libraries

Academic libraries

AN EXPERIMENT WITH ART LIBRARY USERS, SIGNS, AND WAYFINDING

by
Abigail R. Carr

A Master's paper submitted to the faculty
of the School of Information and Library Science
of the University of North Carolina at Chapel Hill
in partial fulfillment of the requirements
for the degree of Master of Science in
Library Science.

Chapel Hill, North Carolina

April 2006

Approved by

_____

Advisor

TABLE OF CONTENTS

Introduction

It is surprising (or perhaps, unsurprising) how often library patrons face confusion when navigating the stacks in search of materials they need, armed with a list of call numbers pulled just minutes before from the library catalog. In my own library research before coming to the School of Information and Library Science, if the library I visited seemed too confusing and difficult to navigate, I would often turn around and leave without even taking up my question with a librarian. One of the more frustrating aspects of wayfinding in a library for those less familiar with academic libraries can be Library of Congress call numbers. More specifically, the layout of shelves combined with the signs displaying the call numbers of books housed on those shelves can create a wayfinding challenge. Shelves are often placed in odd arrangements with only the familiar string of LC call numbers to guide patrons to the titles they are looking for. Just how does the stack-end signage displaying LC call numbers effect users and influence their success or frustration in finding their way in the library?

Research into this problem will be useful for libraries so they may improve ease of wayfinding and alleviate user frustration. As library collections expand, materials are moved and re-shelved to make room for new items with little thought to patron wayfinding needs. In an academic setting, building designers may assume that all patrons are familiar with Library of Congress classification and call numbers, so little effort may be made toward creating a simple arrangement of materials and posting clear, concise stack end signs. Plans for accommodating new books and other materials may not be made ahead of time, so upon arrival of new materials, there may be a frantic

scramble to make materials available as soon as possible. As a result, space is created for everything but everything may not be in the best place. If libraries were more aware of the frustrations of patrons with haphazard arrangements of materials and confusing stack end signage, the more they could do to solve those problems. Libraries could then create plans for expansion based on research findings on patron wayfinding needs; they may be able to optimize the arrangement of their stacks and appearance of stack signage to alleviate patron frustration.

I have often heard anecdotal accounts of public library signage being far more user-friendly, but realized I had not usually paid close attention to the design and content of stack end signage during my previous visits to public libraries. Visits to some local public libraries seemed necessary to develop a picture of the characteristics of clear, user-friendly signage. I decided to visit two local public libraries to study their signage: the Chapel Hill Public Library and the Cameron Village Branch Library.

Stack end signage at the Chapel Hill Public Library is in need of an update—there were quite a few temporary signs in place that could be eliminated by updating the stack end signage to reflect the specific materials on each shelf unit. However, the use of permanent signs with removable letters allows this to be done easily. Each sign contains a general heading at the top in all uppercase letters, such as “NONFICTION” or “REFERENCE.” Occasionally, at the top there are also subheadings in upper and lowercase letters, like “Biography.” Below the headings and subheadings are the Dewey Decimal call numbers, which are occasionally accompanied by other text describing the kinds of materials that may be found on that particular shelf, such as “Maps & Travel” or “Fic A – C.”

Photograph 1: Stack end signage at the Chapel Hill Public Library. Removable lettering allows for easy updating of sign content.

Photograph 2: Headings, subheadings, call numbers and descriptive text help patrons find the material they need.

The Cameron Village Branch Library in Raleigh, NC has recently been renovated. While permanent stack end signage is in place, Dewey Decimal call numbers are missing on many signs. This is probably due to the short amount of time the library has been operating in an expanded space—staff may still be trying to decide on an optimal arrangement of materials, so they are currently relying on major categories temporary, easily moved signage until they have settled into a permanent arrangement.

The Cameron Village Branch Library seems to have taken a layperson friendly approach to the signage. For instance, rather than using library jargon in its signs, layperson's terms are used for categories of materials, i.e. "Magazines" instead of "Periodicals." Large signs hanging from the ceiling over each section display the categories, such as "BETTER LIVING AND LIFESTYLES" and "REFERENCE COLLECTION." Each stack end sign also displays a major heading, such as "ADULT NON-FICTION." Signs at this library are also made to accommodate removable letters so the Dewey Decimal call numbers can be changed as collections expand or are shifted.

Photograph 3: Stack end signage at the Cameron Village Branch Library. Removable Dewey Decimal call numbers allow for easy updating as collections expand.

Even those stack end signs missing the Dewey call numbers are still useful, as many sections of the library include stack end signs that display subcategories of materials housed in that section. For instance, under the main heading "BETTER LIVING AND LIFESTYLES" were shelf units labeled with stack end signs displaying the subheadings "Pets," "Travel," and "House and Home."

Photograph 4: Subheadings on this stack end sign at the Cameron Village Branch Library give patrons directions to the materials in this shelf unit in the "Better Living and Lifestyles" section.

Permanent signs at the Cameron Village Branch Library are also accompanied by some temporary signs mounted in freestanding plastic frames. These signs are placed on various shelves to give patrons further clues to the kinds of materials located in a particular shelf unit. The temporary signs are colorful, easily read, and concise—they may contain one general subheading for the particular category to which they belong, or they may have a listing of three or four even more specific subheadings.

Photograph 5: Signs in the Cameron Village Branch Library Reference collection denote various kinds of information and materials available in that section.

Photograph 6: This sign in the Adult Non-Fiction section denotes a shelf housing American Literature.

Photograph 7: This sign lists several subheadings of materials housed in the shelf unit on which it is placed. These signs can be easily relocated as materials are added to the stacks.

While the signage used in the Cameron Village Branch Library is clear, easily read and concise, the kinds of signage used in each section of the library are not consistent across the entire facility. This may be a cause for confusion in wayfinding. However, as this may be a temporary situation while the library settles into a newly renovated space, the staff has developed an excellent sign system to aid their patrons.

These two library visits helped me to develop an overall picture of the elements of user friendly signage commonly used in some public libraries. It seems that the wayfinding process in libraries is a series of steps in which patrons move from a general category to increasingly more specific subcategories of materials until they find the item they want using that item's call number. This paper explores the amount of information included on stack end signage and that level of information affects patron success in wayfinding in the library. The purpose of my study was to revisit the problems investigated in the literature on the topic of signage and wayfinding. More specifically I wanted to pursue the effect of stack end or LC call number signage on user success in finding materials. I wanted to expand on the research question asked in Gale Eaton's 1990 study at the University of Rhode Island Library: "Do signs have an impact on user success?"

Literature Review

Wayfinding Literature

Literature on this subject is somewhat scarce—that which is available is often ten or more years old. Most research on wayfinding is not focused on libraries and research on patron frustration is usually not focused on wayfinding (Eaton, Vocino and Taylor 83). However, Gale Eaton conducted multiple studies in this area, focusing on wayfinding, spatial cognition and signage in library settings. In two separate papers, Eaton asserted that complexity of the library building and other environmental factors cause confusion for users. These papers were based on a 1989 study on young users in an unfamiliar library setting. One paper focused on whether spatial ability was a factor in the success of stack searches. Another paper reported the results of Eaton's test of a formula developed by Gordon Best in 1969—the formula is based on the premise that the number and complexity of choices a user must make within a space allows a researcher to calculate "route uncertainty." The results of the study turned out to be inconclusive for answering the research questions posed in both papers. In the first paper, Eaton pointed out that the subjects were not a random sample as many of them were skilled in library searching. It was not possible to determine if spatial skills were the true cause of user success, or if success was caused by an outside variable such as general cognitive development of the user (Eaton 83). In the case of the second paper, Eaton could not reject the null hypothesis. There was no correlation between route uncertainty and the speed and directness of user retrievals (Eaton 523). In both cases, the chosen variables seemed less significant than independent factors such as individual search strategies and

skills and how the library building itself affected user searches. However, both papers highlighted important strategies for solving wayfinding problems in the library. The paper focused on spatial skills suggested that there was room for further research into "metacognition" as the most successful subjects were those who stopped to reconsider their search strategies (Eaton 74). The wayfinding and route uncertainty paper suggested that wayfinding problems can be solved by observing users during their searches and taking the library's design into account (Eaton 525). User search strategies that utilized locational aids seemed to work well as the aids limited the amount of information users needed to process (Eaton 84). Therefore, carefully placed signs can help reduce confusion and route uncertainty for users. Eaton suggests that ideally, signs should be used sparingly and as a last resort, and that they should be conspicuous, simple and strategically placed so only the most essential information is available when it is needed (Eaton 526).

One of the main problems with signage seems to be that as library collections expand, collections are rearranged to accommodate new materials without much thought toward an optimum arrangement of stacks and design and placement of stack end signs. Gale Eaton asserts that signs are necessary to compensate for the complexity of library buildings. This includes the sometimes complex arrangements of stacks resulting from expansion. Eaton's 1990 study of the effect of signage on user success discusses this problem. Eaton mentions some factors that aid wayfinding in the library. These include a simple arrangement of materials, open lines of sight in the library space and the absence of "visual clutter" which, due to expansion, is usually inevitable (Eaton, Vocino and Taylor 82). Eaton defines some common signage problems, which often seem to relate to

number and placement of signs. Library personnel place signs to solve the problem of frequent questions—for example, the location of the elevator or restrooms (82). Placement of signs is usually decided by available space, so signs may be placed too high or may be covered by the library's architectural elements (82). Eaton also states that for signs to be effective, research shows that signs must be concise and clear, their placement is critical, and that the fewer there are in place, the better (82). The researchers designed an instrument to survey library users at the University of Rhode Island on their perceptions of library signs. The researchers also conducted observations of user behavior at major library signs including "you are here" maps, directional signs and others. Most surveyed users did find their destinations within the library, but among those users already familiar with the library, most said that memory, not signs, was helpful in finding their way (90).

To make signs more effective, Eaton suggests that they should be "clearly visible and conspicuously colored" to catch user attention. They must be "simple, straightforward and unambiguous" to be easily understood. Signs should not give the user more information than is needed—they should be concise and give only essential information where necessary. They should also be easily moved and revised and frequently reevaluated and updated as the library space changes and expands (95).

A 1992 case study examined a library committee at Indiana University Northwest. The aim of this committee was to make library collections and services more "user-friendly" with special attention paid to library signs (Bosman and Rusinek 72). The researchers did not encounter many other studies focused on user perspectives on signage. They point out that patron viewpoints are a necessary element in designing a

user-friendly library—the term "user-friendly" implies a system focused on patron ease of use (72). The committee conducted a survey of user perceptions of library signs and a sign inventory. Results of the user survey include what may be a very telling point—30.9 percent of sophomores and 22.5 percent of respondents overall had trouble locating their material even after finding a call number (76). A follow up survey done after improvements were made to library signs showed a decline only in this area. Bosman named two factors as influences on this decline—budget constraints had prevented the purchase of new stack end signs, plus the general perception of the collection arrangement was that it was confusing and haphazard (80). To surveyed users, these conditions may have seemed magnified by the significant improvements made to other library signs. The only improvement in this area was in the ratings given by freshmen, sophomores and graduate students. The researchers suggest that the reason for this improvement may be that because many of these students may not have participated in the preliminary study (80). In their conclusion, Bosman and Rusinek point out that this study allowed the project committee to gain patron perspectives on ease of use in their library—they were able to correct obvious problems and document their project in the form of a signage manual that could be used by library staff.

Effective Signage Literature

There is a fair amount of literature available on the elements that make up effective library signage. This literature, with library staff as its target audience, provides useful insight into patron wayfinding behavior and offers many helpful suggestions for creating effective sign systems. One article, written in 1996 by Susan Gilbert Beck, suggests that libraries take a user-centered approach to designing and implementing a

sign system—a rather new concept in the mid-1990s. While ten years later, this may not seem novel it is still a wise approach to improving a library's signage system. The author comments that "signage is only useful if it can be seen and read" (Beck 35). She suggests that library staff walk through the entire building so they may offer their input on user behavior—the idea is to observe the building from the user's perspective so the staff may effectively select the number and type of signs that are best for the library setting (29). Beck goes on to say that during a building walk-through, staff should make note of the most logical places in which to place the signs. They must also take into account lighting and how visible the signs are in a particular location—"signs should be placed so they are clearly visible from as many locations as possible" (34). Beck also comments on the emotional aspects of a user wayfinding experience—she states that "often it is less stressful if a person is introduced to only those parts of a building necessary to his or her functioning" (28). Optimizing a library's sign system to be one that is clearly visible and easy to understand by first experiencing the library from the user perspective can go a long way toward helping patrons avoid wrong turns, frustration, and the experience of being "lost."

Yet more considerations on implementing a good library sign system are discussed in an article by Peter van Allen Sr. First he states: "An institution's 'voice' to the potential user is initially through its signing. Libraries, especially, need these messages to be a) intelligible, b) informative and c) inviting" (Van Allen, Peter R. and Allen 102). Van Allen goes on to discuss the need to use signage optimally due to the architectural features every library has that can create signage difficulties. Building designers do not often take the need for signage into account when designing a library

building—many overlook it entirely. Van Allen includes this issue in his description of the elements of implementation of a new signage system. These elements include money, time, expertise, the existing physical factors such as architectural elements and interior design, and political issues resulting from cooperation (or lack there of) from library administration (102). Van Allen also describes what he calls the "basic tenets of environmental graphics"—these are guidelines for designing effective signs that are easily to read and understand. These basic tenets include choosing a standard font, using upper and lowercase letters (Van Allen explains that these are much easier to read than all uppercase), limiting font sizes, regulating the colors used, making signs that are easy to change and update, and avoiding "unorthodox" materials and fonts as they can make updating the signs more costly and time-consuming (105). This relates to an earlier statement in Van Allen's article. He explained that "signage implies a totality—a large entity made of many visual parts, each of which independently maintains the design standards of the whole system" (104). Van Allen also touches briefly on stack end signage and call numbers, stating that however call numbers are displayed, the display method should be "flexible, changeable, and easily maintained in house" (106). By considering each part of a signage system as contributing to the effectiveness of the whole system, library staff can be aware of what works and what does not within the system and make changes and updates as needed to improve the signage system as the need arises.

Other literature stresses the "big picture" that is projected by a library's sign system. While in his article, Van Allen had mentioned that a library's "voice" to the patron is first through its signs, Susie Andretta points out a statement by the Association

of Research Libraries (ARL). ARL went further to say that a library's signage "sets the stage for a friendly or a hostile environment, for a helpful or a confusing library visit, especially for first-time users" (Andretta 26). Andretta points out the tendency for library staff to produce their own signage in-house due to the availability and low cost of desktop publishing software. However, she explains, the effectiveness of the design element may be overlooked by well-meaning staff on a mission to save the library money, but who lack design expertise (26).

The underlying theme of all literature on effective signage is the optimal number and placement of signs. Signs are often made to answer repetitive questions often asked at the reference desk, but too many signs may create too much clutter and send too many confusing messages to the patrons. John Stanley warns that library staff should avoid the temptation to "put up signs for the sake of it" and that the "fewer and simpler the signs, the more likely they will be read" (Stanley 25). Patrons may completely overlook signs that seem prominently placed to library staff, and even if patrons do realize a sign is there, they may not read it completely. However, this does not necessarily mean that they do not comprehend it. Stanley points out that signs "may not be read word for word, but a subconscious message is still transferred to the reader" (25). Taking a minimalist approach may go a long way toward creating an effective sign system, but if well-designed signs are poorly placed, their effectiveness may be lost on the patrons. As L.R. Bartle points out, "Whatever the sign says, it must be visible to the patrons. It must be large enough to be seen from a long distance, yet placed so that it can be noticed from many perspectives and a shorter distance" (Bartle 399). Bartle also suggests that adhering to a set of usability standards created for those with disabilities and those with vision

problems that could make poorly designed signs useless for them. Bartle states that "complying with [the Americans with Disabilities Act] specifications for signage will not cause problems to nondisabled [sic] patrons and may make spotting and comprehending signs easier for them as well" (399). Perhaps library staff would do well to at least consider studying the Americans with Disabilities Act standards for signage as well as reading manuals other libraries have created for designing their own successful signs. Careful consideration of the library space, coupled with standards and suggestions from other institutions with successful signage systems can help library staff design the optimum sign system to help patrons successfully find their way in the building.

It is also useful to examine some of the many books written about the specific elements that make up clear, readable signage, as well as signage manuals some libraries created for their own buildings. For the purposes of this paper, the main areas of sign system creation that seem the most important are consistency, typography, spacing of type and positioning of the signs themselves.

Consistency seems to be the agreed-upon predominant factor that can make or break a sign system in terms of its success. This can be related to the concept of cognitive mapping, a process every human being uses to find their way in any environment. Pollet and Haskell write: "[Cognitive mapping] is the process whereby one makes use of representations of the spatial environment as it is believed to be (or cognitive maps). These representations act as the basis for everyday spatial behavior" (Pollet and Haskell 21). It is safe to say that signage, as an important element of the library environment, contributes to these cognitive maps. Therefore, consistency in a sign system is paramount, whether the sign system to be put in place is permanent or temporary.

Permanent signs need to reflect consistency in their fonts and layout (Reynolds and Barrett 25). Temporary signs should also be consistent, even though they may require a different treatment than permanent ones (26). In designing signage, library staff should decide on a specific lettering style, sizes and layout and then not vary from it in all signs they put in place.

In the area of typography, while consistency is also important, it is wise to choose a font and lettering size that is easily read. A popular font used by libraries in their signage is Helvetica Medium, which is a clear, readable font, both in its upper and lowercase letters (Pollet and Haskell 38). In fact, the Arizona State University Library chose Helvetica Medium for a sign system they implemented in the mid-1990s—this is the font specified in the signage manual they adopted. A readable font, however, is lost on a patron if it is too small to be read. The same Arizona State University Library signage manual provides a reference chart for the readability of certain sizes of lettering at various distances. For instance, 5/8 inch lettering can be read at up to 15 feet, 1 inch lettering can be read at up to 24 feet, 1 3/4 lettering at up to 42 feet, and so on (Johnson and Hulgin 59). Other literature on label and signage design offers recommendation on the optimum font sizes for readability in libraries and museums. When using dark lettering on a light background that provides good contrast and in a well-lit area, 18 points is the smallest size of lettering that most people can comfortable read from about 20 inches away (Serrell 197). If text is to be read from a distance greater than that, the best font size is between 28 and 48 points (198). In terms of upper versus lowercase letters, it may be tempting to use all capitals in signs, as there may be a tendency to think that all uppercase letters stand out more. However, this is not necessarily the case. Using

upper and lowercase letters together makes sign content far more readable, as signs lettered in all uppercase letters take much longer to read—while people will usually read a short sign, they may give up reading or completely ignore a long one because it is too difficult for them to read (Johnson and Hulgin 60).

Another issue to take into account to ensure maximum readability is spacing with each sign. Letter spacing should separate the letters from one another but not be so far apart that they are not recognizable together as a word (Spencer and Reynolds 31). Spacing between the words should be enough to sufficiently separate words, while line spacing should be greater than word spacing so the reader's eye moves easily along each (31). Margins are another consideration. These seem to be most effective when they are large with a larger margin at the bottom of the sign than at the top, as greater readability is possible if the lettering is proportionate to the size of the sign panel (32).

Signs designed for maximum readability must also be positioned so that readability is still effective. Much of the literature on signage and label design includes recommendations for mounting height. One sign system designed for libraries suggests that signs that will be placed directly on stack ends, as they are for the purposes of this study, should be mounted about five feet and six inches from the floor to the top of the sign (Mallery, DeVore and American Library Association 10). Other literature discussing sign positioning says that "[Signs] should be directly facing the viewer as he approaches them, and their height should be such that they are as close as possible to the natural line of vision" (Reynolds and Barrett 62). Knowing that consistency in signage systems is an important factor, this aspect of sign system implementation is not immune to the effects of a consistent approach. Each kind of sign, whether directional, stack end or otherwise,

should be consistent in its position and height—repeat users of the library will recognize this consistency and learn where to look to find each kind of information represented in the signs (62).

Finally, while decisions about signage appearance and positioning do affect the cognitive mapping process, they are mainly instruments to make the signs' messages clearer. Library patrons depend on the signage content to make their wayfinding decisions during a visit to the library. Signs that include too much information can be just as confusing as signs that do not include enough. Signage literature suggests that "at each decision point the user needs sufficient information to enable him to make a choice at that point, and no more" (Spencer and Reynolds 20). Choosing the appropriate amount of information is tricky and can make or break the effectiveness of signs in cognitive mapping and wayfinding for the patron. Stack end signage can be particularly troublesome in this regard, as even a familiarity with the Library of Congress call number system may not be adequate to help a patron avoid wayfinding confusion. Stack end signage, even if it is well designed in both appearance and positioning, may help patrons little if they are either starved of or overloaded with information on the location of materials in a given area.

Methodology

While a graduate student at the School of Information and Library Science, I have been employed as a research assistant at the Joseph Curtis Sloane Art Library. My experiences while working in this library are one of my main inspirations for pursing this topic. The Sloane Art Library is a small departmental library containing almost 100,000 volumes of a wide variety of different resources on art topics covering all periods, from prehistory to the present and all over the world. Materials in the collection include but are not limited to books, periodicals, manuscript facsimiles, CD-ROMs, video cassettes, DVDs and a collection of artists' books.

The first floor contains books for Library of Congress call numbers NE – Z, the Library's collection of oversize books and the reference section. One area of the first floor is a designated study area with tables and chairs—this area is also surrounded by shelves containing current issues of periodicals. Back issues of many of these periodicals are also shelved in the first floor stacks alphabetically by journal title. Near the Library's main door are eight computer terminals used for searching the online catalog or viewing CD-ROMS. Also on the first floor are the Library's copy machines, the vertical files, an additional computer with a scanner, and a few small rooms in which the Library's closed stacks materials and audio-visual equipment are kept locked up for safe-keeping. Reserve materials are kept behind the circulation desk. Books with LC call numbers A – ND, an additional computer terminal for catalog searching, and the graduate student study carrels are all located on the second floor. The second floor is accessible by an elevator located next to the library's main doors, or a staircase located near the first floor study area.

Though the Sloane Art Library is limited to two relatively small floors, it still poses wayfinding challenges for patrons. First time users of the library almost always fail to realize that the library has a second floor—the limited signage pointing this out is often overlooked, as is the entrance to the elevator. At least once each day I have worked at the circulation desk, I have been approached by a patron looking for a book in the A – ND range who claims they cannot find the book anywhere. When asked if they tried looking on the second floor, I am often faced with the question, "There's a second floor?"

Most stack end signage in the Sloane Art Library shows only the range of LC call numbers, and the signs are printed on 3"x5" pieces of card stock displayed in metal mounts attached perpendicularly to the end of the stacks shelving. These perpendicular mounts are located almost at the top of each shelf unit. While there seem to be enough stack end signs and the font size used to print the signs seems to be large enough, many patrons still seem to have trouble navigating the stacks when looking for materials. It is due to these common problems within the Sloane Art Library environment that I decided to use it as the place I would conduct this study. It is a small enough library as to not be too overwhelming to a first time user, yet has enough inherent wayfinding challenges to suggest a need for improved signage.

It is possible that there may be differences in the way certain users react to physical arrangement and signage. For instance, older students and faculty may have less difficulty locating materials because, as in Gale Eaton's study mentioned above, they have familiarity with the library and memory on their side. Results may be affected by how early or late in the semester the survey is conducted. If members of the study group were asked to fill out a survey close to finals, they may refuse or fill in the survey so

hurriedly that the results do not portray accurately their reactions to the variables. Respondent stress levels may be a potential problem, so choosing the time of year well was an important factor.

As familiarity with the library was a potential problem, it seemed best to choose subjects by asking a particular group, such as a freshman English class or group of information science graduate students, to participate in the study. As groups such as these may have little to no exposure to the Sloane Art Library—they have only attended UNC for a short amount of time or the nature of their course of study does not require visits to this particular library—they would approach the sign observations and surveys with a fresh perspective.

The study took place during the spring semester of 2006 when most students and faculty were regularly on campus. The population studied was the university community. In this study, an action research strategy was employed. With instructor permission, I approached several information science and library science classes at the School of Information and Library Science asking for volunteers for the study. They were asked to visit the Sloane Art Library campus once a week for three weeks to complete brief study activities and fill out a survey once they completed the activities.

Once enough subjects had volunteered and completed consent forms, the library was set up for the study. Then members of the group were notified of the beginning of the study. In their SILS mail folders they received a packet of materials including instructions and a survey. They were instructed that after they completed each study activity and survey, they were to return the study packets to my SILS mail folder.

Each week, a different set of stack end signs was posted in the library, a new packet of materials was distributed in the subjects' mail folders, and the subjects were notified by email that the signs were in place. In their packet of study materials, students received a list of three items to retrieve from various parts of the library using the online catalog and the posted signs. Scrap paper was included with instructions for the subjects—they were encouraged to take a few notes on each wayfinding experience if they wished. The notes were intended aid them in filling out the included survey when they finished searching for each item. Once they completed the tasks on the instruction sheet for that session, they filled out the survey included with the study materials. In the survey, they were to respond to several questions regarding the effectiveness of the signs in aiding their searches. For the second and third sessions of the study, each subject received a sample of one of the signs that were in place during the previous week. In those sessions, they were asked to compare the sample with the signs that were currently in place and answer one additional survey question on this comparison. At the end of each survey, space was included for subjects to add their own comments on the signs and their wayfinding experience.

The library visit and survey process took place three times, each for a different set of signs. Once all the visits were complete, the surveys and any notes the subjects took were collected and all survey data was evaluated. Each set of signs was slightly different, with various levels of complexity. The first set consisted of simple signs including only the range of call numbers for the shelf where they were placed. The second set included the range of call numbers and the range of Library of Congress classes for the books in that range. The third set included all of the information in the second set, but with the

addition of a listing of the kinds of materials that could be found in each range. These sets of signs were posted in the order above. In addition to the stack end signs, small "tent card" signs were placed on top of each computer terminal explaining on which floor particular materials could be found.

It is also important to address some of the biases and problems Gale Eaton faced in her studies, as well as some of the suggestions she and other researchers gave for effective library signage. As mentioned in the review of the literature, Eaton mentioned that her subjects were not a random sample as many of them were skilled at searching and wayfinding in the library. I tried to address this issue by choosing my subjects randomly from various classes at the School of Information and Library Science. When approaching the classes to ask for their participation, I made certain to explain the criteria for their eligibility for the study: they were not eligible to participate if they were very familiar with the Sloane Art Library. This way, even if the subjects were familiar with library searching and wayfinding, they would still be affected by the "learning curve" of trying to find materials in an unfamiliar library.

In designing this study, I tried to account for many of the suggestions found in literature regarding effective library signage. As mentioned in the literature review, Eaton said it was best to use signs as sparingly as possible, only give the most essential information on the signs, and to place them so they are easily viewed and not covered by architectural elements in the library. I only used one or two signs for each range of stacks and I only provided enough information for the purposes of each study session. For the lettering on the stack end signs, I chose to use the Tahoma font as it was the same font used in the signs that are usually in place at the Sloane Art Library. The font sizes used

range between 28 points at the smallest and 72 points at the largest—the LC call numbers were in 72 points, the LC subject headings were in 60 points, and the listings of the kinds of materials on the shelf were usually 28 or 36 depending on how well each line fit on the sign. The signs were printed in black type on plain white 8 ½" by 11" card stock. The signs were mounted flush to the surface of the end of each shelf unit with about 5 feet and six inches between the floor and the top of the sign. The "tent card" signs were also printed in 28 point Tahoma font in black type on white card stock. One tent card was placed directly in front of the base or on top of the monitor of each "point of search" computer in the library. By adhering to the suggestions found in literature on effective signage, I hoped to eliminate any confusion that might be caused by "bad" signage, so that the subjects paid the most attention to the amount of content included on the signs.

Data

A total of nineteen subjects participated in this study, though not all nineteen subjects participated in each week of the study. Fifteen subjects participated in the first week of the study, all nineteen participated in the second week, and seventeen participated in the third and final week.

Week #1 Results

During the first week of the study, signs showing only the ranges of call numbers for each shelf unit were put in place. The subjects received three book titles to locate, and were asked to answer three questions regarding each search experience. The first question was "Were you able to find this book (or the place this book belongs) solely using the stack end signs?" The subjects answered this question by circling either 'yes' or 'no.' Each subject's results for each book title are summarized in Table 1 below.

Subject	1	2	3	4	5	6	7	8	10	11	13	14	15	16	17
Title 1	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y
Title 2	Y	N	Y	Y	Y	N	Y	N	Y	Y	Y	N	Y	Y	Y
Title 3	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y

Table 1: Subject responses to Question 1.

Out of a total of 45 searches, three per subject, there were 39 successful searches and 6 unsuccessful searches. Most subjects were able to locate the book or the spot where the book would have been if it had been checked out before they completed the survey.

The second question on the survey was about the length of time it took the subject to find the book: "From the time you left the computer, how long did it take you to find this book?" The subjects answered by circling one of the following: "Less than 1

minute," "1-2 minutes," "3-4 minutes," or "5+ minutes." Each subject's time for each book title are summarized in Table 2 below.

Subject	1	2	3	4	5	6	7	8	10	11	13	14	15	16	17
Title 1	1-2	-1	1-2	-1	1-2	3-4	+5	1-2	1-2	1-2	-1	3-4	3-4	-1	1-2
Title 2	-1	1-2	-1	1-2	+5	+5	+5	+5	1-2	3-4	1-2	+5	3-4	3-4	3-4
Title 3	1-2	1-2	1-2	1-2	3-4	1-2	-1	3-4	3-4	1-2	+5	1-2	1-2	1-2	-1

Table 2: Subject responses to Question 2.

Out of 45 total searches, 8 searches were completed in less than one minute, 20 were completed in one to two minutes, 10 were completed in three to four minutes, and 7 were completed in five or more minutes. Most subjects were able to locate each book within one to two, or three to four minutes, though some subjects took less than one minute or five or more minutes to locate one or more titles.

The third question asked the subjects to circle three objectives that described their search experience from a group of ten possible objectives. These objectives included "frustrating," "difficult," "a breeze!," "efficient," "disorienting," "confusing," "inefficient," "surprising," "easy," and "challenging." Subject responses for each title are summarized in Table 3 below.

Objective	Title 1	Title 2	Title 3	Total
a breeze!	7	3	7	17
easy	11	6	9	26
efficient	11	5	10	26
surprising	4	5	5	14
challenging	1	4	2	7
confusing	1	6	3	10
disorienting	4	5	5	14
inefficient	3	4	2	9
frustrating	0	3	0	3
difficult	1	1	0	2

Table 3: Subject responses to Question 3.

Table 3 contains the number of times subjects chose a particular objective to describe their search experiences for each title, as well as the total number of times each objective was chosen. Very few subjects chose completely positive objectives for each wayfinding experience, though overall, most subjects seemed to have positive experiences. Positive objectives were chosen 69 times, while negative objectives were chosen 38 times. “Easy and “efficient” were the most commonly chosen positive objectives, while the most commonly chosen negative objective was “disorienting.”

At the end of the survey, subjects were given space to write any comments they had on their search experiences. Most comments focused mainly on the appearance of the signs. One subject said, “I found the large signs with dark, bold font [sic] really helpful in finding these books. The signage was really clear to me.” Another, commenting on the “tent card” signs placed at the computer terminals, said, “The sign that says ‘Go to the 2nd Floor” is too small. I didn’t even notice it until I was completely frustrated.” Another subject also commented on the tent cards: “I am not certain most would see the sign tents at the computer terminal that tell you what call numbers are on what floor. Because I anticipated a challenge, I was more observant than I might otherwise be.”

Week #2 Results

For the second week of the study, the next set of stack end signs for each shelf unit displayed the range of call numbers and the Library of Congress subject headings included in each shelf unit. Again, the subjects received a list of three new book titles and were asked the same three questions regarding each search experience. Subject responses for each question for each book are summarized in the tables below.

Subject	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Title 1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	Y
Title 2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Title 3	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Table 4: Subject responses to Question 1: Were you able to find this book (or the place were this book belongs) solely using the stack end signs?

During this session, out of a total of 57 searches, only 3 searches were unsuccessful. In this case, three subjects had trouble locating the same book.

Subject	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Title 1	-1	-1	-1	1-2	1-2	+5	-1	1-2	1-2	1-2	1-2	1-2	-1	-1	1-2	+5	3-4	5+	1-2
Title 2	1-2	-1	1-2	-1	3-4	3-4	-1	1-2	1-2	3-4	3-4	-1	3-4	3-4	3-4	-1	5+	1-2	3-4
Title 3	1-2	-1	-1	-1	-1	1-2	-1	-1	1-2	-1	1-2	-1	1-2	1-2	3-4	-1	1-2	3-4	3-4

Table 5: Subject responses to Question 2: From the time you left the computer, how long did it take you to find this book?

Out of 57 total searches, 20 searches were completed in less than one minute, 21 were completed in one to two minutes, 12 were completed in three to four minutes, and 4 were completed in five or more minutes. During this session, most subjects completed their searches much more quickly than in the first week of the study.

During this session, subjects were once again asked to circle three critical objectives that they felt described their search experiences. They were given the same list of objectives to choose from as they were in the first session.

Objective	Title 1	Title 2	Title 3	Total
a breeze!	8	8	12	28
easy	12	10	16	38
efficient	6	13	14	33
surprising	4	7	4	15
challenging	2	5	2	9
confusing	3	1	1	5
disorienting	6	5	3	14
inefficient	4	3	2	9
frustrating	3	1	0	4
difficult	3	1	0	4

Table 6: Subject responses to Question 3.

During this session of the study, the most commonly chosen objective was “easy,” and positive objectives were chosen 99 times. Once again, if subjects chose a “neutral” objective, they mainly chose “surprising,” which was chosen 15 times. Negative objectives were chosen 36 times. “Disorienting” was once again the most commonly chosen negative objective—most subjects did not seem to find their search experiences particularly frustrating or difficult, though they did have a tendency to become disoriented during their search experiences.

During the second week of the study, some additional questions were included on the survey for the subjects to answer. For the first additional question, subjects were asked to compare the currently posted signs with a sample of a sign used in the previous week—a copy of the sample sign was included in the study packets. The question was, “Which of these signs is the most useful?” Subjects were to answer by circling either “Week 1” or “Currently posted.” Out of the 19 subjects participating in the second session, 5 subjects did not answer the question. Out of the remaining 14 subjects, 5 chose Week 1 as the most useful, while 9 subjects chose the signs currently in place for Week 2.

The second additional question was “Does the information given make a difference in your search experience?” Subjects were to answer by circling “Yes” or “No.” Out of the 19 subjects participating, 8 subjects answered “Yes,” 10 answered “No,” and one subject did not answer the question. After this question came a related one: “If yes, comment briefly on how it makes a difference.” Many subjects did not fill in an answer for this question, but some of those that did answer provided useful feedback. One subject commented, “[The signage] reinforces my heading in the right direction by

providing general subject areas that match roughly the topic of the book I'm looking for." Regarding the Library of Congress subject headings included on the second week's signs, another subject commented, "I like the subjects—it makes for a better browsing experience too—but its reassuring to know at a glance that I'm in the right section." Some subjects felt they only needed the call numbers to find the items they were searching for: "I hesitate to say this, but the [subject heading] text was almost distracting—in looking for a specific [book], all I need is the call number . . . I probably would have used the [subject headings] for browsing purposes."

Once again, subjects were provided with space in which to write any comments they had about their search experiences. On the subject of the subject headings, one subject did not notice they were included until they answered the survey questions concerning comparison of signs for Week 1 and Week 2: "I think the signs would be very effective for browsing . . . though, beyond initially noticing that the signs were different, I didn't look at the additional text—just the call numbers." Another subject provided a useful comment on the tent card signs posted at each computer: "I also found the tabletop signs on the computer terminals useful. They helped begin my search and oriented me as to which floor to start on." Finally, one subject wrote a detailed comment about the subject headings, and that they may be useful for those library patrons more accustomed to shopping in bookstores:

> I did not have a difference in my search simply because I was only using call numbers and did not think about the book topic. However, if I were using the library for my own needs, I would like the signs so I could browse by topic. Most students don't know the LC number/subject correspondences. Also, people are used to bookstores and Amazon.com which tend to be arranged by subject.

During Week 2, an employee of the Sloane Art Library also pointed out that a few patrons not participating in the study commented on the signs when visiting the circulation desk. A few patrons commented that they were more inclined to browse the stacks due to the inclusion of the subject headings. Further studies would need to be conducted to investigate this occurrence, but the addition of the subject headings to Sloane Art Library stack end signage may have increased browsing behavior in the library.

Week #3 Results

For the third and final week of the study, the stack end signs placed in the Sloane Art Library contained the Library of Congress call numbers, the LC subject headings and a brief listing of the kinds of materials contained in each shelf unit. For example, a shelf containing books on religious architecture would display the range of call numbers housed in that shelf unit, the LC subject heading "Religious Architecture," and a listing of the subjects of books in the range (i.e. "American Churches/Meetinghouses, English Cathedrals, French Cathedrals). Once again, the subjects were supplied with a list of three new book titles and asked the same three questions as in the previous two sessions. Subject responses are summarized in the table below.

Subject	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Title 1	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y
Title 2	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y
Title 3	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Table 7: Subject responses to Question 1: Were you able to find this book (or the place were this book belongs) solely using the stack end signs?

Out of a total of 51 searches, only three were unsuccessful. One subject was unable to locate Title #1, while two subjects were unable to locate Title #2. There was not much change between Week 2 and Week 3 in terms of success in finding the books—the vast

majority of subjects found all three books or the spot where the books were usually located.

Subject	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Title 1	1-2	-1	1-2	1-2	1-2	3-4	-1	5+	5+	1-2	1-2	1-2	-1	3-4	1-2	3-4	1-2
Title 2	1-2	1-2	1-2	1-2	5+	3-4	-1	1-2	1-2	-1	1-2	1-2	-1	1-2	1-2	3-4	3-4
Title 3	-1	1-2	-1	-1	3-4	5+	-1	-1	1-2	-1	1-2	-1	-1	1-2	1-2	1-2	3-4

Table 8: Subject responses to Question 2: From the time you left the computer, how long did it take you to find this book?

Out of 51 total searches, 14 were completed in less than one minute, 25 were completed in one to two minutes, 8 were completed in three to four minutes, and 4 were completed in five or more minutes. The majority of searches were completed very quickly once the subjects found the call numbers in the online catalog and left the point of search computer. There was a very slight decline in the number of searches completed in under a minute, but not enough of one to be significant.

Once again, subjects were asked to circle three critical objectives describing their search experiences, and were once again given the same list of objectives to choose from.

Objective	Title 1	Title 2	Title 3	Total
a breeze!	7	9	12	28
easy	10	12	15	37
efficient	7	11	9	27
surprising	5	3	4	12
challenging	4	0	1	5
confusing	4	4	2	10
disorienting	7	4	4	15
inefficient	3	2	1	6
frustrating	1	3	1	5
difficult	1	1	0	2

Table 9: Subject responses to Question 3.

During Week 3, the results of this question were much like those of Week 2: “easy” was the most commonly chosen objective, if a “neutral” objective was chosen it was most

often “surprising” or “challenging,” and the “negative” objective chosen most often was “disorienting.” Positive objectives were chosen 92 times while negative objectives were chosen 38 times. This week, “inefficient” was chosen 6 times and “frustrating” was chosen 5 times.

The same additional questions asked in the survey for Week 2 were once again asked during Week 3. Included in the study packets was a sample of a sign used in the Week 2 session. Subjects were asked to compare the sample sign with the currently posted signs and the Week 1 signs that only contained ranges of LC call numbers. Subjects were to respond to the question “Which of these signs is the most useful?” by circling “Week 1,” “Week 2,” or “Currently Posted.” This week, the answers were evenly distributed: out of 17 subjects, 6 chose the signs for Week 1, 6 chose the signs for Week 2 and 5 chose the currently posted signs.

Again, the subjects were asked “Does the information given make a significant difference in your search experience?” and were asked to answer by circling “Yes” or “No.” Out of the 17 respondents, 7 answered “Yes” and 10 answered “No.” Yet again, subjects were asked to write comments about their answer to this question: “If yes, comment briefly on how it makes a difference.” One subject commented, “Giving more information on end signs helps users make sense of a library’s contents, which in turn makes them feel more welcomed by the library.” Another subject, however, was not as positive: “[The] Week 3 signage was distracting—too much information. [It] took considerably longer (or felt like it did) to find books.” Other subjects echoed this sentiment, with some going further to say that the additional information included in the Week 3 signs was distracting: “This week there was more information listed on the signs.

I spent more time trying to figure out whether the title seemed to match the information on the signs rather than concentrating on the call number range."

Finally, subjects were once again allowed space at the end of the survey to write any additional comments they had about the signage and their wayfinding experiences. Opinions on the inclusion of the listings of kinds of materials on each shelf were mixed. One subject thought the design of the signs contributed to the clarity of included information: "Emphasizing the hierarchy of importance in signs by changing the font size was nice." Of those subjects who felt the additional information was confusing, some went on to explain their thoughts further:

> One thing about more descriptive signage is that if you are unfamiliar with the subject area of the book for which you are looking, having subject areas on the sign doesn't help. All I want to see is the call number, although I did like Week 2's signage more because I liked getting a general sense of what I was looking for. But Week 3's signs had so much text as to make them distracting. Again, though, I like the idea of more descriptive signs for browsing—just not for a known item search.

Most of the comments regarding the additional information on the Week 3 signage were similar to the one above. Many subjects felt the additional information was useful for browsing, but too distracting to patrons searching for a specific call number.

Discussion and Conclusions

When I began researching this topic, I hoped to answer the question posed in Gale Eaton's 1990 study: "Do signs have an impact on user success?" More specifically, I wanted to investigate the impact of stack end signage on user wayfinding success in the library. I suspected that the stack end signage commonly used in academic libraries was not enough for users not familiar with the Library of Congress classification system—signs displaying only LC call numbers could help them locate their desired materials, but not without a significant level of confusion and frustration.

Visits to two local public libraries solidified my speculation that if academic libraries took a similar approach to stack end signage, patrons would have a much easier time navigating the library. I adopted this approach in designing the study—for the first session, the subjects had only LC call numbers to guide them; for the second, they had both LC call numbers and subject headings; for the third, they had LC call numbers and subject headings with the addition of listings of the kinds of materials in each shelf unit. I suspected that the subjects would prefer the signage used in the second week—the call numbers and subject headings would be sufficient, and any more information than that would be considered unnecessary and distracting.

I anticipated that I would notice an increase in successful searches and an improvement in search times for the search exercises from week to week. I observed somewhat of an improvement in these areas between the Week 1 and Week 2 sessions. However, between the Week 2 and Week 3 sessions, the results were nearly the same—there were only three unsuccessful searches among the over 50 total searches completed

each week. A slight decline in search times did occur between Week 2 and Week 3, which I attribute to the distraction some subjects mentioned resulting from the additional information added for that week. While three visits to the library did allow the subjects to develop familiarity with the layout and shelf arrangements, the memory factor did not seem to skew the results—many subjects still claimed to feel disoriented during their search experiences.

The most telling results came from the comparison question section of the Week 2 and Week 3 surveys and from the subjects' comments on all three surveys. In Week 2, most subjects preferred the currently posted signs—they preferred to have LC subject headings to help them orient themselves while searching for the call numbers. In Week 3, however, the results were almost evenly spread between all three iterations of signage. Comments from subjects who felt the additional information made a difference in their wayfinding experience seemed to feel that they only information truly necessary for the search activities was the call. It is possible that some subjects were so focused on the task at hand that they were frustrated by the appearance of "extraneous" information. Still, some subjects felt the LC subject headings and/or the material listings for the shelves were helpful in orienting themselves and that they helped cut down on the number of "wrong turns" and the amount of confusion they experienced.

Despite different attitudes among subjects toward the information included on each iteration of signs, there seems to be a common them in the subjects' comments. Whether they felt the LC subject headings and material listings were helpful or distracting, most commented that the LC call numbers were the most critical item included on the signage for a known-item search, while the subject headings and material

listings were especially useful for browsing in the stacks. A few subjects commented that because they were only using the call numbers to find their way to the books they were asked to locate, they only noticed the call numbers on the signs, ignoring subject headings or any other additional information until they reached the comparison section of the survey. This relates back to the literature on effective signage: users only need sufficient information in place at each decision point in a search (Spencer and Reynolds, 20).

Reports from Sloane Art Library staff on increased browsing behavior solidified the subjects' comments on the usefulness of subject headings and material listings in browsing. Library staff noticed increased browsing among library patrons—this was an unintended outcome of this study. One patron even told a staff member that she had been using the library regularly for quite some time but that she had not known the library had books on printmaking in its collection—on that particular visit, she noticed that the LC subject heading for printmaking and took the time to browse that section. It makes complete sense that bookstores use general subject headings to organize their inventories—subject headings encourage browsing.

This study also highlighted some inherent issues and problems with the layout and placement of signs in the Sloane Art Library. One or two subjects commented that there were no stack signs for the shelves at the beginning and end of the range of call numbers housed on the second floor. At each end of the second floor, books are housed on shelves that are flush with the walls, so signs are placed very high above the shelves at each end of the central walkway through the middle of that floor. All of the other shelf units are freestanding with stack end signs mounted flush to the ends of each shelf unit. Signs

placed up high above the shelves on each end of the second floor are clearly visible from the middle of the room. However, if a subject followed the other stack end signs to the beginning or end of the A – ND range, the signs for the very beginning and end of those ranges might appear hidden by the books on the top shelves. If the 8 ½" by 11" signs used in this study are not clearly visible, the smaller 2" high signs normally in place definitely are not. Another factor that may have contributed to wayfinding problems may have been the physical arrangement of materials on the shelves. Two subjects commented that some of their confusion came from the fact that they expected the call numbers to be ordered so they ran along one side of the library's shelves and then back up the other:

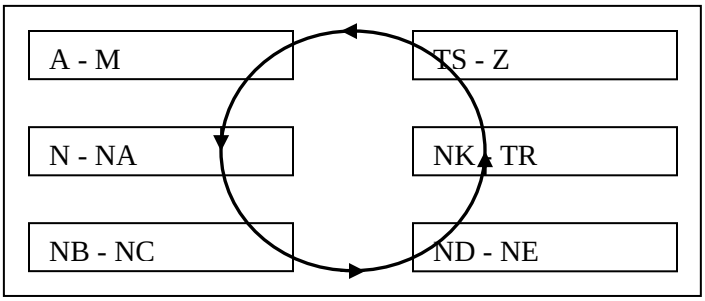


Diagram 1: Illustrates shelf unit call numbers ordered in a "counter-clockwise" orientation.

On the second floor of Sloane Art Library, however, shelf unit call numbers are ordered to run across the shelf units from left to right, similar to the diagram below:

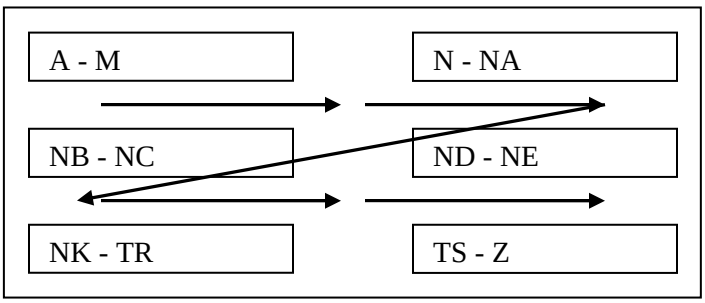


Diagram 2: Illustrates shelf unit call numbers ordered in a left to right orientation.

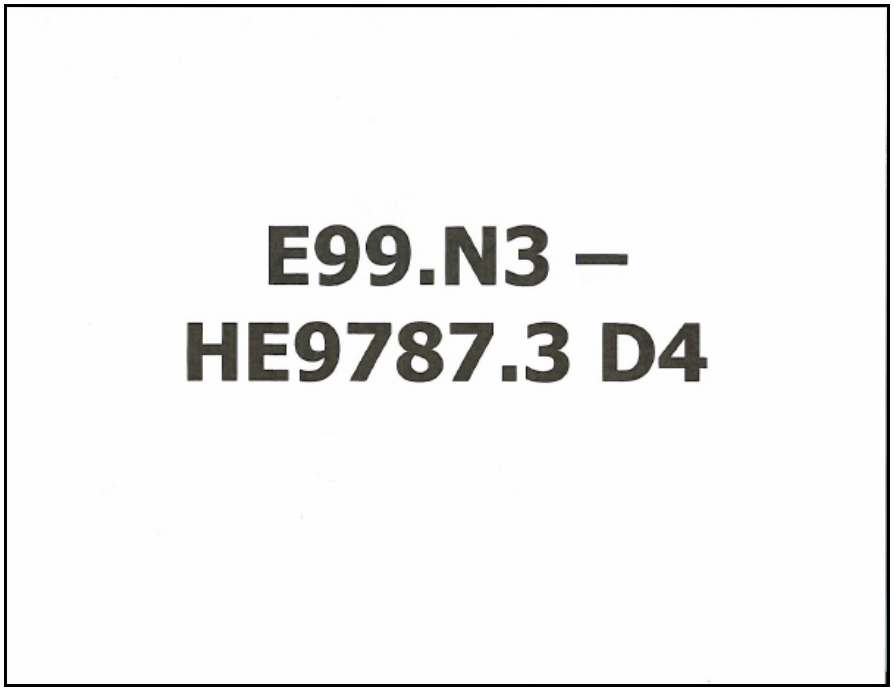
This orientation may cause a great deal of back tracking and disorientation for patrons. This an example of the special considerations libraries must take into account when designing a signage system—in the case, the signage should be designed to address the arrangement of materials on the shelf units and make this left to right configuration of materials obvious to patrons.

The results of this study lead me to believe that an effective approach to a sign system for a small academic library would be the layperson-friendly approach I observed at the Cameron Village Branch Library, which seemed similar to that used in large chain bookstores. Stack end signage displayed subject headings and the range of call numbers for each shelf unit, while smaller signs in moveable frames displayed listings of the kinds of materials found in that range. This way, those searching for known items in the stacks would have the necessary information for their task (the call numbers), while those browsing would have subject headings to orient them. When searching a particular shelf, browsers would have the temporary signs to help them decide what materials they want, while those searching for a particular call number would probably be so consumed by the task that they may not even notice the material listings.

In further studies, I would want to test this approach in a similar fashion—a three week study in which subjects search for books aided by three iterations of guiding signs. In the first week, only the Library of Congress call numbers would be displayed. In the second week, the subject headings would be added. In the third week, rather than adding the material listings to the stack end signage, they would be placed on the shelves themselves in the form of small signs in freestanding frames. This way, those performing a known-item search would perhaps not be as distracted by the material listings, but find

the freestanding material listings as a method of double-checking the accuracy of their route through the stacks. Perhaps by taking this approach to a sign system, subjects would feel less disoriented and more comfortable with wayfinding in the library space.

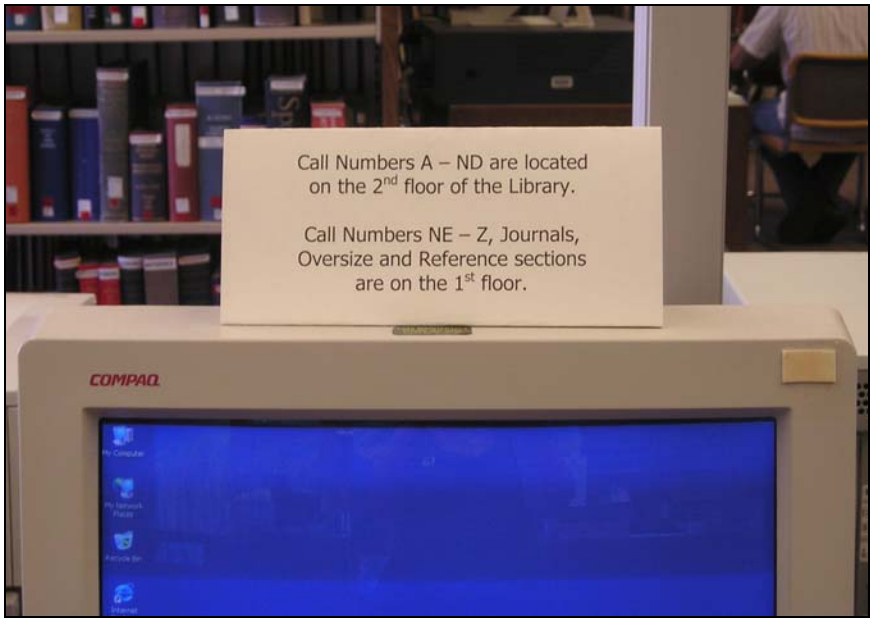
In addition, another search activity may help explore the effectiveness of subject headings and material listings on browsing. A method of testing this might be to give the subjects a listing of topics covered by the library's collection. Subjects would be asked to choose a topic and find two books—one by simply browsing the stacks until they found a book that fit the topic and one by using the online catalog to find a call number first. Subjects would be asked to complete a survey about their opinions of the signs and their wayfinding experiences, including specific questions about the addition of the moveable material listings in the third week. This way, comparisons between known-item searches and browsing experiences can be made, and a more accurate picture of the effectiveness of the "bookstore model" of signage systems can be developed.



Appendix A: Sample of Week 1 signs displaying Library of Congress call numbers only.

Appendix B: Sample of Week 2 signs displaying Library of Congress call numbers and subject headings.

Appendix C: Sample of Week 3 signs displaying Library of Congress call numbers, LC subject headings, and listings of materials found in the call number range.



Appendix D: Photograph of one of the tent card signs placed at the point of search computer terminals.

Bibliography

Andretta, Susie. "Visual Literacy." Library + Information Update 3.4 (2004): 26-7.

Bartle, L. R. "Designing an Active Academic Reference Service Point." Reference and User Services Quarterly 38.4 (1999): 395-401.

Beck, S. G. "Wayfinding in Libraries." Library Hi Tech 14.1 (1996): 27-36.

Bosman, E., and C. Rusinek. "Creating the User-Friendly Library by Evaluating Patron Perception of Signage." Reference Services Review 25.1 (1997): 71-82.

Eaton, E. Gale, Michael C. Vocino, and Melanie Taylor. "Evaluating Signs in a University Library." Collection Management 16.3 (1992): 81-101.

Eaton, Gale. "Lost in the Library: Are Spatial Skills Important in Shelf Searches?" Journal of Youth Services in Libraries 5.1 (1991): 77-86.

---. "Wayfinding in the Library: Book Searches and Route Uncertainty." RQ 30.4 (1991): 519-27.

Johnson, Carolyn, and Wayne Hulgin. "Arizona State University: Library Signage Manual." Effective Library Signage: A SPEC Kit. Ed. Laura Rounds. Washington, DC: Association of Research Libraries, Office of Management Services, 1995. 57-82.

Mallery, Mary S., Ralph E. DeVore, and American Library Association. A Sign System for Libraries. Chicago: American Library Association, 1982.

Pollet, Dorothy, and Peter C. Haskell. Sign Systems for Libraries : Solving the Wayfinding Problem. New York: Bowker, 1979.

Reynolds, Linda, and Stephen Barrett. Signs and Guiding for Libraries. London: Bingley, 1981.

Serrell, Beverly. Exhibit Labels : An Interpretive Approach. Walnut Creek: Alta Mira Press, 1996.

Spencer, Herbert, and Linda Reynolds. Directional Signing and Labelling in Libraries and Museums : A Review of Current Theory and Practice. London: Readability of Print Research Unit, Royal College of Art, 1977.

Stanley, John. "Signs: Dos and Don'ts." Library + Information Update 3.4 (2004): 25.

Van Allen, Peter R., and P. R. van Allen. "A Good Library Sign System: Is it Possible?" Reference Services Review 12.2 (1984): 102-6.